

## Five new species of the genus *Polycatus* Heller, 1912 (Coleoptera: Curculionidae: Polycatini) from the Mindanao Island (Philippines), and new examples of mimicry among weevil genera

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Five new species of the genus *Polycatus* Heller, 1912 (Coleoptera: Curculionidae: Entiminae: Eupholini) from the Mindanao Island (Philippines) are described and illustrated: *P. bramanti* Rukmane sp. nov., *P. jaegeri* Bramanti & Bramanti sp. nov., *P. mimicus* Bramanti, Bramanti & Rukmane sp. nov., *P. vivesi* Bramanti & Bramanti sp. nov. and *P. waoensis* Bramanti & Bramanti sp. nov.. The new synonymy *Polycatus aurofasciatus* Heller, Heller, 1912 (= *P. aurofasciatus* var. *dilatisignatus* Heller, 1929, syn. nov.) is established. A key for species of the *aurofasciatus* group of Mindanao and Basilan islands is proposed. Additionally to already report mimetic pairs, new examples of mimicry between *Polycatus*, *Pachyrhynchus* Germar, 1824, *Metapocyrtus* Heller, 1912 and *Calidiopsis* Heller, 1913 are included. Distribution maps, as well as new faunistic records are provided.

Key words: Coleoptera, Curculionidae, *Polycatus*, fauna, new species, taxonomy, mimetic pairs, Mindanao, Philippines.

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### INTRODUCTION

The genus *Polycatus* Heller, 1912 (Polycatini) was described from Basilan Island (Philippines). In the original description of the genus, only *P. aurofasciatus* Heller, 1912 was included. The genus currently consists of four species and one variation: *P. aurofasciatus* Heller, 1912 (Basilan),

*P. aurofasciatus* var. *dilatisignatus* Heller, 1929 (Basilan), *P. eupholoides* Heller, 1915 (Mindanao), *P. opulentus* Heller, 1929 (Mindanao), and *P. panayensis* Schultzze, 1918 (Panay). Marshal (1956) in his review of the tribe Celeuthetini placed the genus *Polycatus* in separate tribe Polycatini. As in modern taxonomy variant is a neutral term used without taxonomic significance,

type of *P. aurofasciatus* var. *dilatignatus* Heller, 1929 were revised on taxonomical status.

*Metapocyrtus* Heller, 1912 and *Calidiopsis* Heller, 1913.

In recent past, we had a possibility to study types of species of *Polycatus*, which were described by Heller (1912, 1929). The examination of the type specimens has helped us to find several new species coming from relatively new collections. In our first contribution to the taxonomy of the genus *Polycatus*, we present illustrated descriptions of five new taxa from Mindanao Island. All studied taxa share at least one common character: the presence of scally marking on basal part of prothorax. Thus, the *aurofasciatus* species group for these taxa is erected. We provide a key for species of this group, distributed in Mindanao and Basilan islands. Together with descriptions of new species, we decided to include remarks for previously described species, mostly to show new faunistic records and different variations across the Mindanao and Basilan Island.

Although various authors already contributed on mimicry between tropical Coleoptera (Rukmane & Barševskis 2016, Yoshitake 2017, Barševskis 2018). We include illustrated plates with new and already reported mimicry examples between sympatric species of *Polycatus* Heller, 1912, *Pachyrhynchus* Germar, 1824,

## MATERIAL AND METHODS

The studied material is deposited in the following collections:

**DUBC** - Daugavpils University beetle collection, Daugavpils, Latvia

**MTD** - Senckenberg Natural History Collections, Dresden, Germany (O. Jäger)

**BRAA** - Bramanti Andrea and Alessandro's private collection, Pietrasanta (Lucca), Italy

Morphological studies were carried out using Nikon SMZ745T stereomicroscope with Nikon DS-Fi1 digital camera. Images were taken with Panasonic Lumix DMC-FZ20 with macro lens Raynox DCR150, stacking system MJKZZ Q-Rail 250Plus. To examine male and female terminalia, specimens were macerated in hot water and dissected under the stereoscopic microscope.

Abbreviations and measurement technology follow Bollino et al. (2017).

## RESULTS

### Key to species of the *aurofasciatus* group from Mindanao and Basilan islands

**1 (4)** Markings of pinkish, bright red or orange color. Eyes large, strongly prominent. Scutellum large, V – shaped. Western part of greater Mindanao: Zamboanga and Basilan Island

**2 (3)** Prothorax moderately punctured, elongated. Apex of rostrum with deep triangular impression. Scaly markings of pinkish / pale orange color. Basilan Island and Mindanao: Zamboanga ..... ***Polycatus aurofasciatus* Heller, 1912**

**3 (2)** Prothorax nearly smooth, sub-spherical. Apex of rostrum with shallow impression. Scaly markings of bright red color on elytra and bright orange on prothorax. Mindanao: Zamboanga..... ***P. jaegeri* sp. nov.**

**4 (1)** Coppery or metallic green markings. Eyes small or medium sized, moderately prominent. Scutellum small, roundish or triangular. Central and Northern parts of Mindanao

**5 (8)** Rostrum in lateral view with small bulge from before the basal edge of the eye. Scales on lateral parts of rostrum elongated to oval, mingled with hair-like scales. Puncture rows on elytra roughly dotted, intervals strongly expressed. Prothorax in lateral view nearly straight

**6 (7)** Elytra marked with irregularly dispersed, metallic green scale spots. Northern Mindanao, Iligan.....*P. opulentus* Heller, 1929

**7 (6)** Elytra marked with chaotically distributed transverse and longitudinal scale lines of opaque blue color. Central Mindanao, Bukidnon.....*P. vivesi* sp. nov.

**8 (5)** Rostrum in lateral view with medium-sized or large bulge from basal or just after basal edge of eye. Scales on lateral parts of rostrum delicate, rounded, with a few dark, general hairs on the forehead. Elytra with moderately deep puncture rows. Prothorax in lateral view with bulge just before the middle

**9 (13)** Rostrum with moderately large bulge. Scutellum small, triangular shape. Each elytron with two confluent scaly patches in male and three in female.

**10 (11)** Each elytron with three general scale patches, sometimes with one additional small patch near suture, just before the middle of elytra. Mindanao, Tangkulan .....*P. eupholoides* Heller, 1915

**11 (12)** Each elytron with five to seven longitudinal scale lines and additional scaly markings along lateral margin of elytron. Mindanao, Bukidnon .....*P. mimicus* sp. nov.

**12 (10)** Elytra without patches of scaly markings, with asunder round scales, nearly smooth, closely without punctured intervals. Mindanao, Lanao .....*P. bramantii* sp. nov.

**13 (9)** Rostrum with very large bulge. Scutellum large, roundish. Each elytron with two more or less confluent scaly patches, each patch consists of various number of smaller, longitudinal or transverse patches, connected in various ways. Mindanao, Wao region .....*P. waoensis* sp. nov.

**1. *Polycatus aurofasciatus* Heller, 1912** = *Polycatus aurofasciatus* var. *dilatisignatus* Heller, 1929 syn. nov. (Fig. 1) (Fig. 2)

Type locality: Basilan Island. Type in MTD, examined. Type locality: Basilan Island. Type in MTD, examined.

Male, 12145 (yellow label); Typus (red label); Staatl. Museum fur / Tierkunde. Dresden (white label); Philippinen / Bazilan II.-III. 98 (white label); Doherty / ex. coll. H. Fruhstorfer (white label). Male, *Paratype* (white label); Island of / Basilan / Baker (white label); 1920 / 3 (yellow label); 13184 (white label); Staatl. Museum fur / Tierkunde, Dresden (white label).

Female PARATYPE (red label); Philippinen / Bazilan II.-III. 98 / Doherty (white label); Staatl. Museum fur / Tierkunde, Dresden (white label); *Polycatus / aurofasciatus* / Det. K. M. Heller 1912 (white label). Female, var. *dilatisignatus* / Typus (red label); Island of / Basilan / Baker (white label); 1920 / 3 (yellow label); Staatl. Museum fur / Tierkunde, Dresden (white label).

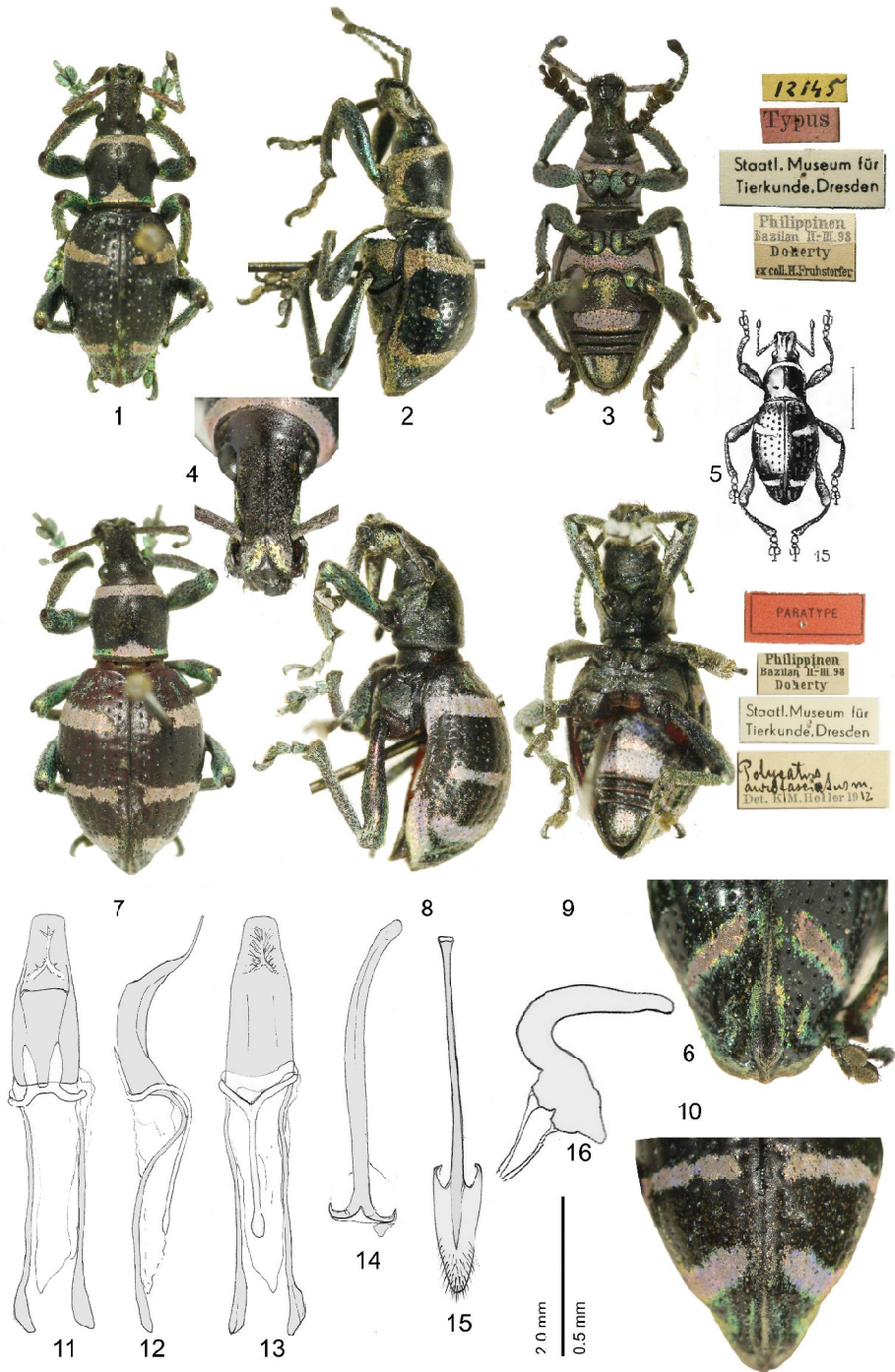


Fig. 1. TYPE specimens of *P. aurofasciatus* (MTD). 1-5 male; 6-10 female; 11 – aedeagal body in ventral view; 12- aedeagal body in lateral view; 13 - aedeagal body in dorsal view; 14 – sternite IX; 15 – sternite VIII; 16 – spermatheca

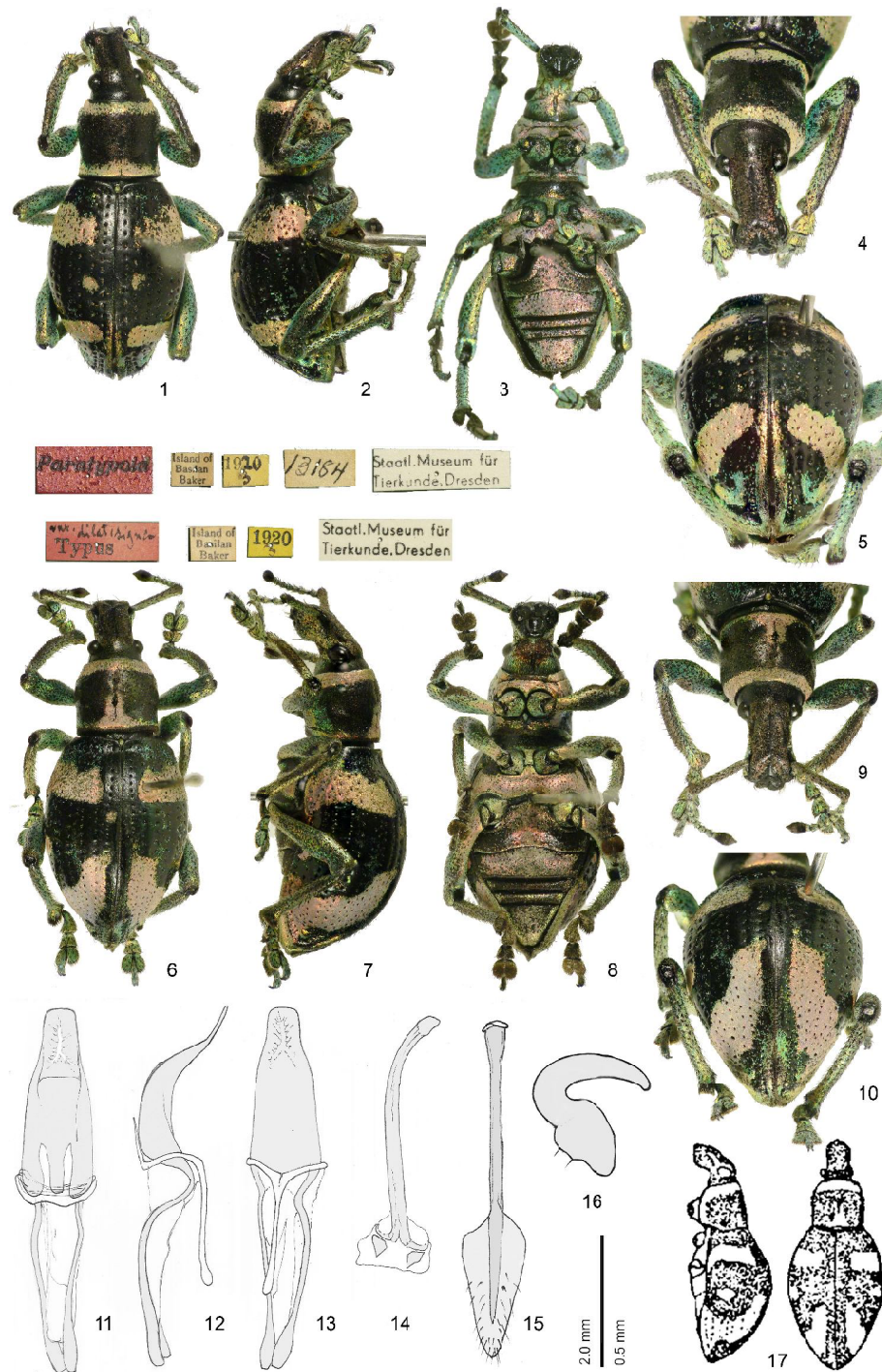


Fig. 2. TYPE specimens of *P. aurofasciatus dilatisignatus* (MTD). 1-5 male; 6–10, 17 female; 11 – aedeagal body in ventral view; 12- aedeagal body in lateral view; 13 - aedeagal body in dorsal view; 14 – sternite IX; 15 – sternite VIII; 16 – spermatheca

**Note.** Originally Heller described *P. aurofasciatus* and *P. aurofasciatus* var. *dilatissignatus* from the Basilan Island, showing on sympatry of both. We observed series of specimens that correspond morphologically to type species from Western Mindanao, Zamboanga province. Therefore, we add this new record to current species distribution range. Sympatrical specimens found in Zamboanga province match in various degree the pattern of both *P. aurofasciatus* and *P. aurofasciatus* var. *dilatissignatus* having the only difference of pattern of elytral spots that vary in size (narrow in *P. aurofasciatus* and wide in *P. aurofasciatus* var. *dilatissignatus*). Having found no more morphological or geographical difference, we consider *P. aurofasciatus* var. *dilatissignatus* as synonym of monotypic *P. aurofasciatus*.

**2. *Polycatus jaegeri* Bramanti & Bramanti, sp. nov. (Fig. 3, 10, 11, 1)**

**Type material.** Holotype, Male (Fig. 3.1-5): Philippines: Mindanao Isl. / Zamboanga del Norte prov., Gotalac, / II. 2019, local collector leg. (white label); "HOLOTYPE / *Polycatus jaegeri* Bramanti & Bramanti" (red label) (BRAA).

**Paratypes** (22 males, 14 females): 3 males, 1 female. Philippines / Mindanao Isl. / Gotalac, XI. 2018 / local collector leg.; 1 male, 2 females, same as previous, but II. 2019; 3 males, 2 females same as previous, but III. 2019; 1 male, 1 female, same as previous, but VI. 2019; 1 male, Philippines: Mindanao Isl. / Zamboanga del Norte prov., Siocon / local collector leg.; 1 male, 2 females, same as previous, but V. 2019; 1 male, same as previous, but IX. 2019 (all on white rectangular label, all in BRAA); 1 male, PHILIPPINES / Mindanao, Zamboanga / Gotalac / X. 2015 / local collector leg.; 4 females, same as previous, but IX. 2016; 5 males, PHILIPPINES / Mindanao, Zamboanga, Gotalac / IX. 2018 / local collector leg.; 3 males, 1 female, same as previous, but X. 2018; 1 female, PHILIPPINES / Mindanao, Zamboanga, Siocon / II. 2019 / local collector leg. (all on white rectangular labels, all in DUBC). All with additional red label: "PARATYPE / *Polycatus jaegeri* Bramanti & Bramanti".

**Distribution.** Mindanao Isl., Zamboanga del Norte prov. (Fig. 10).

**Description.** Measurements (n=3): LB: 10.6-12.3 (holotype 12.3; mean 11.45); LR: 2.6-2.65 (holotype 2.65; mean 2.6); WR: 1.3-2.35 (holotype 2.35; mean 1.8); LP: 3.4-4.0 (holotype 4.0; mean 3.7); WP: 3.25-3.45 (holotype 3.45; mean 3.35); LE: 8.0-9.45 (holotype 8.0; mean 8.7); WE: 4.15-5.55 (holotype 5.55; mean 4.8).

Body black, shiny, with markings of bright red to orange round to recumbent scales on elytra, pale orange scally markings on pronotum and metallic blue to green on legs, underside less shiny, with pale orange and metallic blue markings. Head strongly punctured except for occipital area. Eyes large, strongly prominent from the outline of head. Forehead weakly bulging dorsally, three times as wide as eye. Rostrum twice as long as head, slightly longer than wide (LR/WR 1.13) dorsally with deep longitudinal medial groove from base of forehead to apical 1/2, sparse dark hairs on basal part; moderate triangular impression on apical part; laterally covered with metallic blue scales under eyes and metallic green scales on pregenae; long light brown hairs on apical part, hairs more dense near apex; underside with few metallic blue scales; antennal scrobe interrupted just before anterior edge of eye. Antenna covered with white rosy scales; antennal scape covered with dark hairs arranged in longitudinal rows; antennomeres with dark hairs on apical part; basal antennomere 1.5 times as long as wide, shorter than antennomere II; antennomere II 2.5 times as long as wide, two times longer than III-VIII; III-VII subequal in size, same length and width; club narrowed at base, widest at apical 1/2, nearly 2.5 times as long as wide. Prothorax nearly smooth, subspherical, with very fine punctation very gently punctured, longer than wide (LP/WP 1.16), anterior edge straight, posterior edge slightly curved medially; with the following markings: 1) transverse line along apical margin; 2) transverse line along basal margin, line medially with peak; 3) patch on each latero-ventral part, patch connected with apical and basal transverse lines; 4) ventral part completely covered with single scales; in dorsal contour widest at apical 1/2,

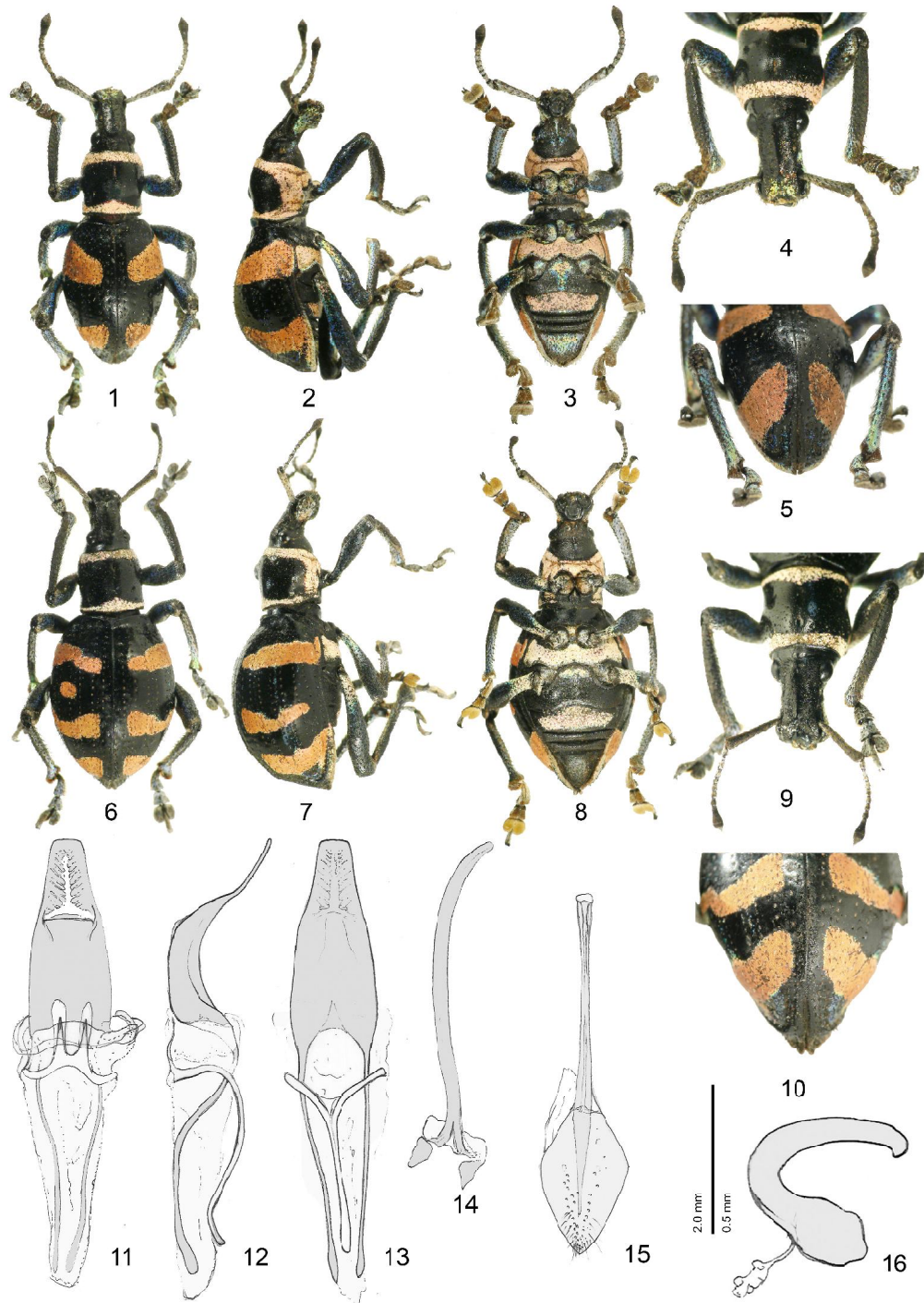


Fig. 3. *P. jaegeri* sp. nov. (BRAA). 1-5 male; 6-10 female; 11 – aedeagal body in ventral view; 12- aedeagal body in lateral view; 13 - aedeagal body in dorsal view; 14 – sternite IX; 15 – sternite VIII; 16 – spermatheca

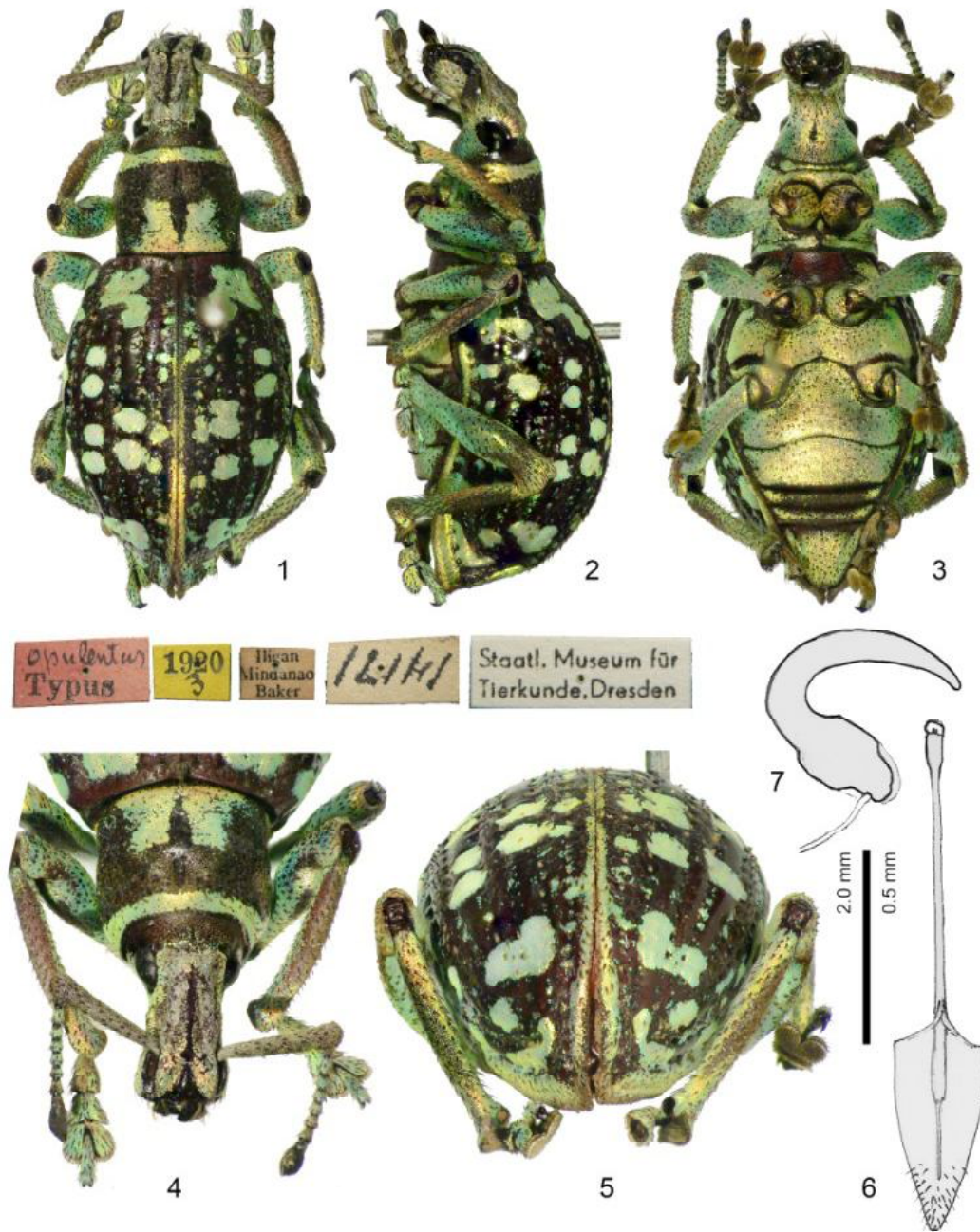


Fig. 4. *P. opulentus* (MTD). 1-5 female; 6 – sternite VIII; 7 – spermatheca



narrowed to just after the middle and minutely widened to base. Elytra slender, LE/WE 1.44, with strongly expressed intervals of deep rows of punctures, puncture corresponds by short hairs along basal half and longer, dark hairs along apical half; each elytron with the following markings: 1) suboval, transverse patch on basal half, from middle of interval II to lateral margin; 2) suboval, apically incurved transverse patch on apical half, from middle of interval II to lateral margin; 3) hair-like scale line along lateral margin from middle to apex; in dorsal contour widest just in the middle; LE/LP 2.0, WE/WP 1.61; metasternum completely covered with pale orange scales; ventrite I with metallic blue and pale orange scales on central part; II completely covered with pale orange scales; III-IV with rare metallic blue scales on lateral parts; V with metallic scales on central part; short, light hairs on all ventrites, hairs distinctly denser on ventrite V. Coxa covered with metallic scales of various colour; femur with metallic blue single scales, mingled with short light hairs; entire length of tibia with long dark hairs, metallic scales along internal margin. Aedeagus as in Fig. 3.11-14.

Female. Measurements (n=3): LB: 14.45-15.85 (mean 14.9); LR: 3.6-4.1 (mean 3.9); WR: 1.8-2.8 (mean 2.2); LP: 3.35-4.2 (mean 3.9); WP: 3.4-4.0 (mean 3.7); LE: 11.0-11.5 (mean 11.2); WE: 6.0-7.75 (mean 7.0). Larger, elytra wider, LE/WE 1.6, apex of elytra more strongly narrowed. Each elytron with three spots of scales, one on basal half, one just after the middle and one on apical half, other as in males (Fig. 3.6-10).

**Differential analyses.** *Polycatus jaegeri* sp. nov. is similar to *P. aurofasciatus* Heller, 1912 from Basilan Island by the large, strongly prominent eyes and large, V shaped scutellum. Both species also share similarly located scally spots on elytra, but species may be distinguished by the following characters: 1) prothorax of *P. aurofasciatus* with more rough puncture, less convex than in *P. jaegeri* sp. nov.; 2) impression on apical part of rostrum much deeper in *P. aurofasciatus*; 3) bright red scally markings on elytra and bright orange markings on prothorax

in *P. jaegeri* sp. nov., and pinkish markings on both elytra and prothorax in *P. aurofasciatus*.

**Etymology.** The species is dedicated to Olaf Jäger (Dresden), who allowed us to study types of *Polycatus* described by K.M. Heller and W. Schultze in the past century.

**Mimicry.** This new species is involved into the following mimicry complex: *Polycatus jaegeri* – *Pachyrhynchus zamboanganus* – *Metapocyrtus* sp. – *Calidiopsis speciosa* (Fig. 11.1-4).

### 3. *Polycatus opulentus* Heller, 1929 (Fig. 4, 10)

Type locality: Mindanao Island, Iligan (Fig. 10). Type in MTD, examined.

Female, *opulentus* / Typus (red label); 1920 / 3 (yellow label); Iligan / Mindanao / Baker (white label); 12141 (white label); Staatl. Museum für Tierkunde, Dresden (white label).

### 4. *Polycatus vivesi* Bramanti & Bramanti, sp. nov. (Fig. 5, 10)

**Type material.** Holotype, Male (Fig. 5.6-10): Philippines, Mindanao Isl. / Bukidnon, Cabanglasan / X. 2015 / local collector leg. (white label); "HOLOTYPE / *Polycatus vivesi* / Bramanti & Bramanti" (red label) (BRAA).

**Paratypes** (17 males, 4 females): 2 males, PHILIPPINES / Mindanao, Mt. Kitanglad / VI. 2005 / local collector leg.; 2 males, Philippines, Mindanao / Bukidnon, Cabanglasan / X. 2016 / local collector leg.; 2 males, same as previous, but XI. 2017; 1 female, Philippines, Mindanao / Bukidnon, Intavas / VII. 2018 / local collector leg.; 1 male, Philippines, Mindanao / Bukidnon, Panamakan / VII. 2014 / local collector leg. (all on white labels, all in BRAA); 1 female, PHILIPPINES / Mindanao, Bukidnon, Cabanglasan / IX. 2015 / local collector leg.; 1 female, same as previous, but X. 2015; 4 males, PHILIPPINES / Mindanao, Mt. Kalatungan / VI. 2014 / local collector leg.; 1

male, 1 female, same as previous, but VII. 2014; 3 males, same as previous, but X. 2015; 1 male, PHILIPPINES / Mindanao, Compostela, Pantukan / X. 2016 / local collector leg; 1 male, PHILIPPINES / Mindanao, Intavas / IX. 2015 / local collector leg. (all on white rectangular labels, all in DUBC). All with additional red label: "PARATYPE / *Polycatus vivesi* / Bramanti & Bramanti".

**Distribution.** Mindanao Island. (Fig. 10).

**Description.** Measurements (n=3): LB: 11.25-12.35 (holotype 11.25; mean 11.73); LR: 2.05-2.45 (holotype 2.45; mean 2.25); WR: 1.3-2 (holotype 1.3; mean 1.75); LP: 3.3-4.15 (holotype 3.75; mean 3.73); WP: 3.1-3.6 (holotype 3.1; mean 3.27); LE: 8.4-9.6 (holotype 8.4; mean 8.87); WE: 5.55-5.9 (holotype 5.55; mean 5.72).

Body black, elytra, prothorax and head strongly shiny, with markings of metallic blue to green, round to recumbent scales on all parts except for antennae with light pearl scales. Head smooth, without hairs dorsally. Eyes small, prominent from outline of head, peak just in middle. Forehead nearly two times as wide as eye, with moderate bulge. Rostrum nearly two times as long as wide (LR/WR 1.9), with oblong, subtriangular dorsal impression from apical 1/3 to middle of forehead; in dorsal contour ventral part incurved along midline; laterally densely covered with general scales; portion under antennal scrobe bulging laterally, interrupted just before anterior edge of eye. Antenna covered with pearl scales and light brown hairs in all length. Prothorax minutely punctured, longer than wide (LP/WP 1.21), covered with sparse roundish scales, with additional scale patches: 1) transverse continuous line along apical margin; 2) subtriangular median spot along basal margin, spot interrupted in the middle by longitudinal medial groove; 3) large scally patch on each latero-ventral parts; 4) underside densely covered with general scales; in lateral contour nearly straight, weakly bulging just before the middle. Elytra short, LE/WE 1.5, intervals of rows of puncture strongly expressed, puncture followed by short, light hairs, hairs along apex longer; each elytron with various number of chaotically

dispersed scale lines and small scaly patches; LE/LP 2.2; WE/WP 1.8; underside densely covered with general scales, ventrite I with central scally patch, III-IV with sparse general scales on apical half; legs covered with sparse general scales, femur with short, light hairs on basal half, tibia with longer light hairs. Aedeagus as in Fig. 5.11-12.

Female. Measurements (n=1): LB: 12.8; LR: 2.2; WR: 1.7; LP: 3.3; WP: 3.2; LE: 8.9; WE: 6.6. Fig. 5.1-5.

**Differential analysis.** Based on size of the eyes and scutellum, marking colour and restricted distribution, *Polycatus vivesi* sp. nov. is similar to *P. eupholoides*, *P. mimicus* sp. nov. and *P. opulentus*. It can be distinguished from all these species by: 1) from *P. eupholoides* and *P. mimicus* sp. nov. by bulge on rostrum, that starts before the basal edge of the eye in *P. vivesi* sp. nov. and from the basal edge in *P. eupholoides* and *P. mimicus* sp. nov. as well as more strongly rugose elytra in *P. vivesi* sp. nov., combined with unique scally markings; 2) from *P. opulentus* by its unique markings on elytra that consist of chaotically dispersed scaly lines instead of dotted elytra of *P. opulentus*.

**Etymology.** The new species is dedicated to Eduard Vives, for appreciation of help and useful comments during the research.

##### 5. *Polycatus eupholoides* Heller, 1915 (Fig. 6, 10)

Type locality: Mindanao Island, Tangkulan (Fig. 10). Type in MTD, examined.

Male, *eupholoides* / Typus (red label); Mindanao (yellow label); 1914 / 14 (yellow label); Tangkulan / Mindanao (white label); Staatl. Museum für Tierkunde, Dresden (white label).

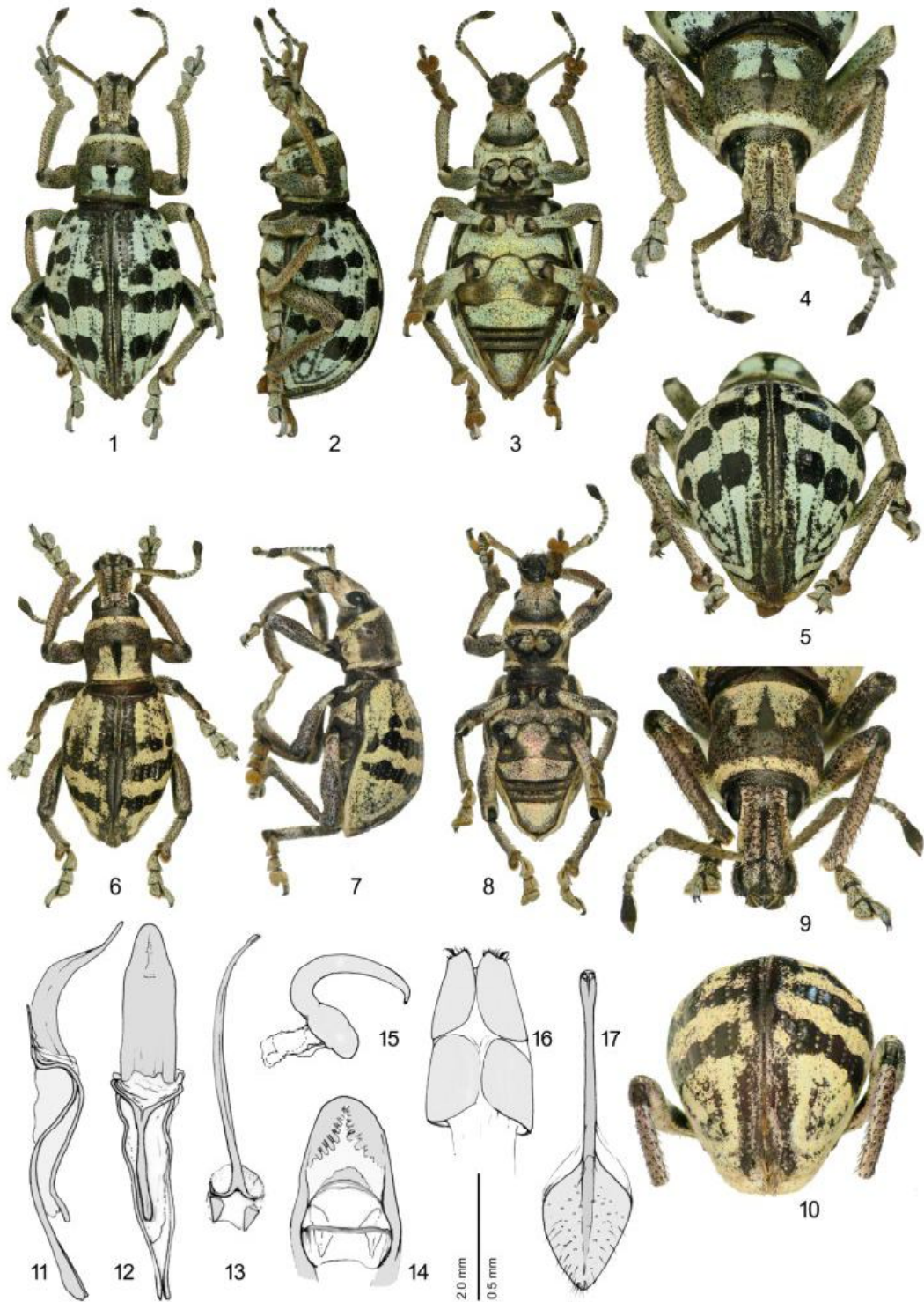


Fig. 5. *P. vivesi* sp. nov. (BRAA). 1-5 male; 6-10 female; 11- aedeagal body in lateral view; 12- aedeagal body in dorsal view; 13 - sternite IX; 14 - aedeagal body in ventral view; 15 - spermatheca; 16 - ovipositor; 17 - ventrite VIII

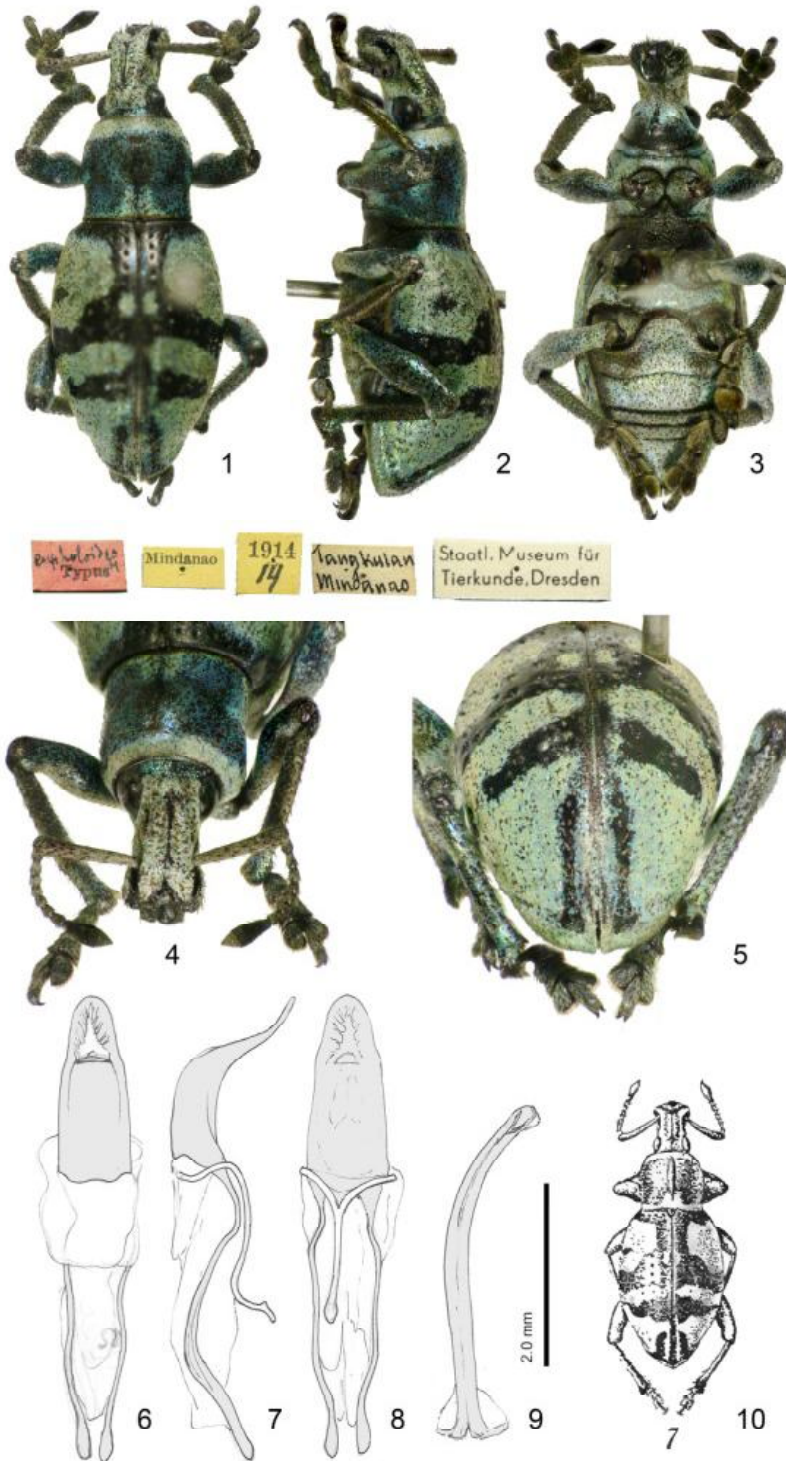


Fig. 6. TYPE of *P. eupholoides* (MTD). 1-5 male; 6 – aedeagal body in ventral view; 7 – aedeagal body in lateral view; 8 – aedeagal body in dorsal view; 9 – sternite IX; 10 – drawing of *P. eupholoides* from it's original description

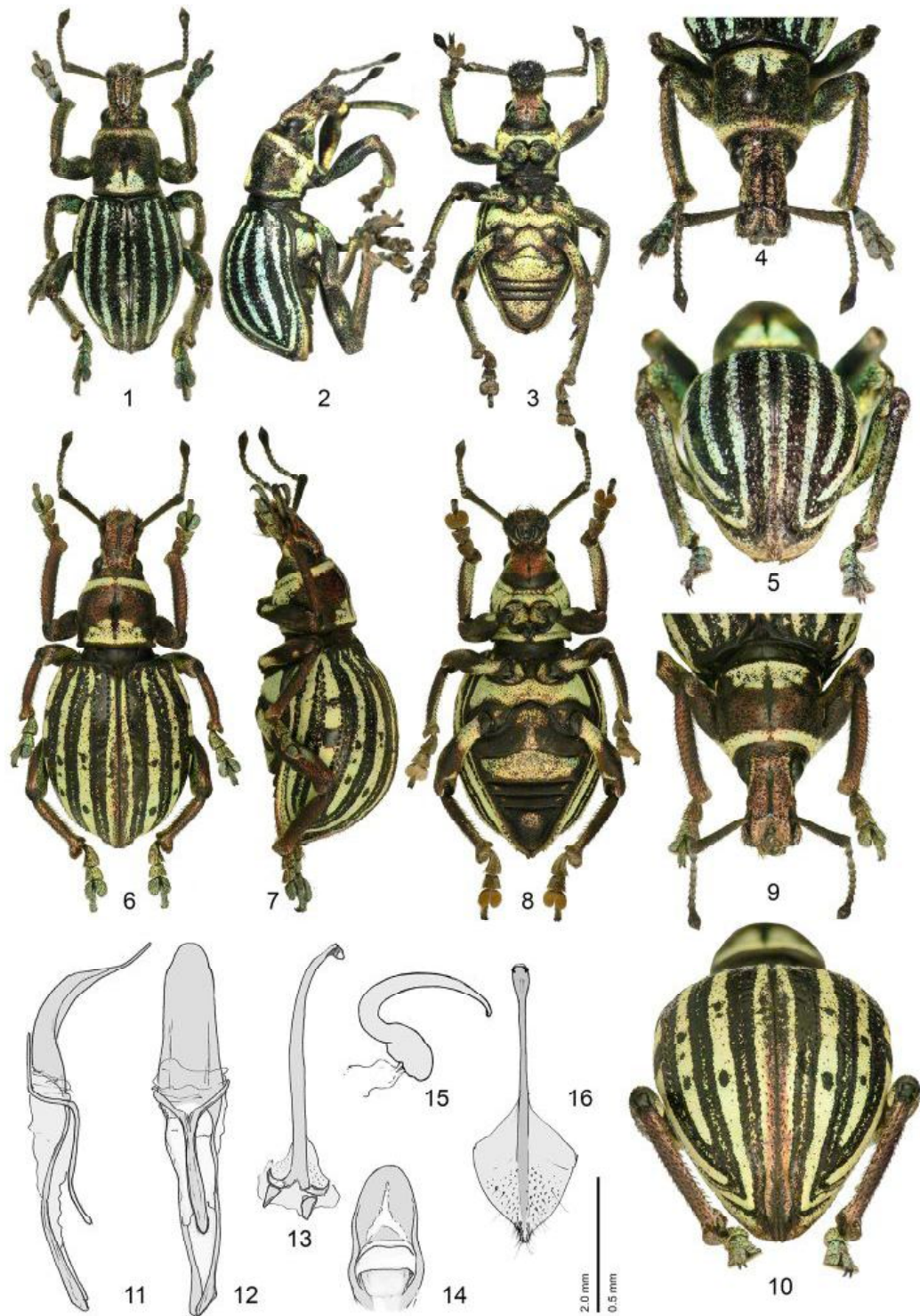


Fig. 7. *P. mimicus* sp. nov. (DUBC). 1-5 male; 6-10 female; 11 – aedeagal body in lateral view; 12 – aedeagal body in dorsal view; 13 – sternite IX; 14 – aedeagal body in ventral view; 15 – spermatheca; 16 – sternite VIII

**6. *Polycatus mimicus* Bramanti, Bramanti & Rukmane, sp. nov.** (Fig. 7, 10, 11, 5)

**Type material.** Holotype, Male (Fig. 7.1-6): PHILIPPINES / Mindanao, Bukidnon, Cabanglasan / II.2016 / local collector leg. (white label); "HOLOTYPE / *Polycatus mimicus* / Bramanti, Bramanti & Rukmane" (red label) (DUBC).

**Paratypes** (2 females): 1 female, PHILIPPINES . Mindanao, Bukidnon, Mt. Kalatungan / V.2014 / local collector leg (DUBC); 1 female, PHILIPPINES / Mindanao, Bukidnon, Cabanglasan (BRAA). All with additional red label: "PARATYPE / *Polycatus mimicus* / Bramanti, Bramanti & Rukmane".

**Distribution:** Mindanao Island, Bukidnon prov. (Fig. 10).

**Description.** Measurements (n=1): LB: 7.4; LR: 1.9; WR: 1.6; LP: 3.4; WP: 3.3; LE: 7.4; WE: 5.2. Body black, elytra slightly shiny, with markings of pale green, yellowish and coppery round to recumbent scales on body. Head with indistinct punctation, together with rostrum covered with sparse coppery scales dorsally. Eyes medium-sized, apex just in the middle. Forehead bulging dorsally, nearly 2.5 times as wide as eye. Rostrum longer than wide, LR/WR: 1.19, with moderate medial longitudinal groove and oblong impression dorsally; laterally with markings of yellowish scales that circumscribe each eye and long, golden hairs on genae and near mouth; underside with markings of coppery scales, with two grooves, one longitudinal, one transverse. Antenna sparsely covered with pale coppery scales, mingled with long brown hairs. Prothorax with indistinct punctation, nearly same length and width (LP/WP: 1.03), in dorsal contour nearly straight, slightly widened along apical ½; anterior edge slightly curved, posterior edge slightly incurved; with the following scally markings: 1) transverse continuous scale line along apical margin; 2) roundish patch of scales on medial part of basal margin, patch interrupted by weak longitudinal groove on disc; 3) longitudinal patch on each latero-ventral part. Elytra short, LE/WE 1.42, intervals of puncture rows moderate, fol-

lowed by short light brown hairs; each elytron with five longitudinal, continuous scale lines between intervals and one additional scale line along lateral margin, second and fifth line connected along apex; underside densely covered with yellowish scales, except ventrite III and IV with scally markings on apical half. Aedeagus as in Fig. 7.11,12,14.

Female (n=2). Measurements: LB: 10.2-10.6 (mean 10.4); LR: 1.6-2.0 (mean 1.8); WR: 2.2-2.4 (mean 2.3); LP: 3.2-4.0 (mean 3.6); WP: 4.0-4.4 (mean 4.2); LE: 10.2-10.6 (mean 10.4); WE: 7.2-8.2 (mean 7.7). Seven scally lines on each elytron, underside with narrow longitudinal patch on ventrite I and oblong transverse patch on ventrite II. Other as in males (Fig. 7.6-10).

**Differential analysis.** This new species is similar to *P. eupholoides* by small eyes and scally markings on prothorax and legs, as well as longitudinal medial groove on prothorax; and to *P. vivesi* sp. nov. by short, minutely rounded elytra as well as scally markings on prothorax together with longitudinal medial groove, but can be easily distinguished by the following characters: 1) from both *P. eupholoides* and *P. vivesi* sp. nov. by unique elytral ornamentation, that consists of longitudinal continuous lines between punctured intervals; 2) eyes slightly larger than that in *P. eupholoides*; 3) rostrum in dorsal contour widened along apical half in *P. mimicus* sp. nov. and nearly straight in *P. eupholoides*; 4) prothorax of *P. vivesi* sp. nov. in lateral view nearly straight, with small bluge on sub-apical part, prothorax of *P. mimicus* sp. nov. with bulge from middle to apical part.

**Etymology.** This new species is named after the fact of the mimicry with *Pachyrhynchus tiko* Rukmane, 2016.

**Mimicry.** The new species is involved into mimicry complex with *Pachyrhynchus tiko* Rukmane (Fig. 11.5-6).

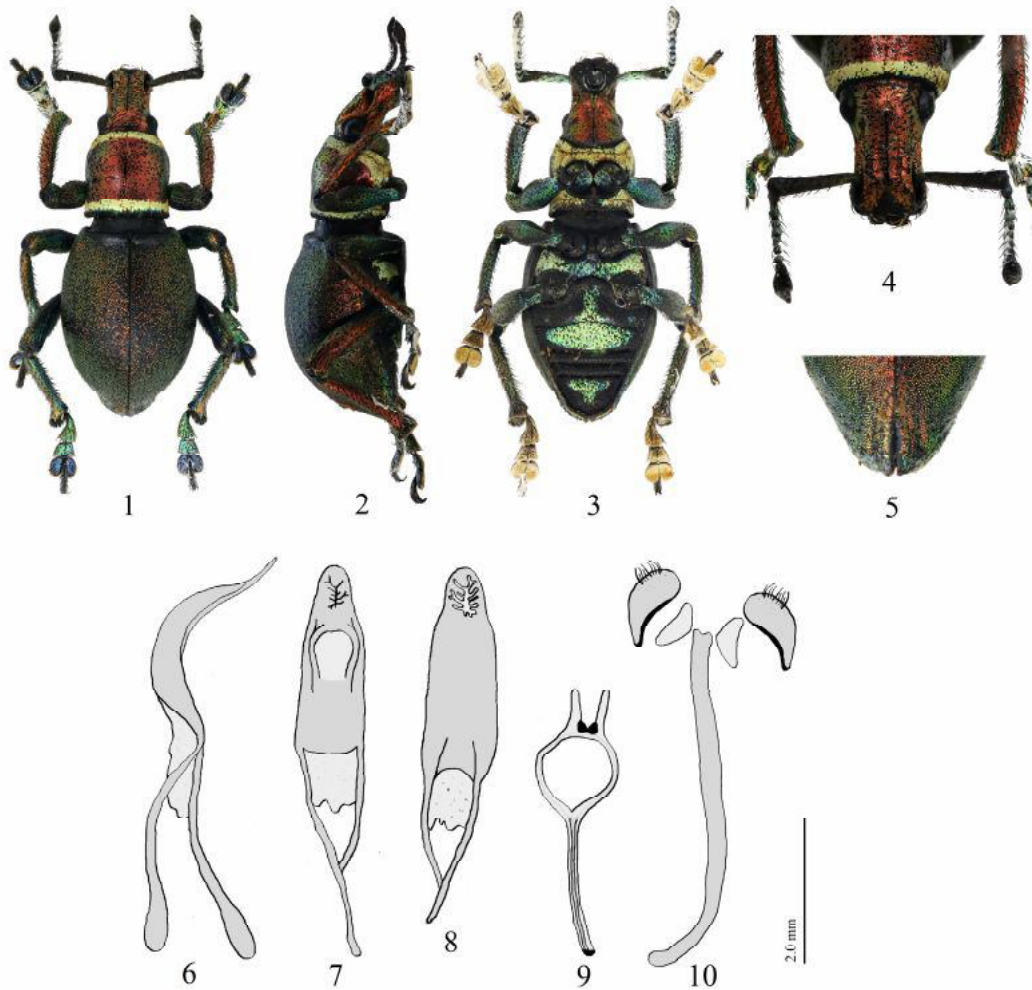


Fig. 8: *P. bramantii* sp. nov. (DUBC). 1-5 male; 6-8 aedeagal body; 9 - tegmen; 10 – sternite IX

**7. *Polycatus waoensis* Bramanti & Bramanti sp. nov.** (Fig. 9, 10)

**Type material.** Holotype, Male (Fig.9.1-5): PHILIPPINES / Mindanao, Lanao del Sur, Wao / XII. 2017 / local collector leg. (white label); ‘‘HOLOTYPE / *Polycatus waoensis* / Bramanti & Bramanti (red label) (BRAA).

**Paratypes** (27 males, 17 females): 1male, PHILIPPINES / Mindanao, Lanao del Sur, Wao / IV.2016 / local collector leg.; 1 female, same data, but IX. 2016; 1 male, same data, but X. 2016; 2 males, 1 female, same data, but XII. 2016; 2 males,

1 female, same data, but II. 2017; 1 male, 1 female, same data, but XI. 2019 (all in DUBC); 1 male, Philippines, Mindanao / Lanao del Sur, Wao / II. 2017 / local collector leg.; 1 male, same data, but III. 2017; 2 males, same data, but XI. 2017; 2 males, 3 females, same data, but XII. 2017; 1 male, same data, but I. 2018; 2 males, 4 females, same data, but I. 2020; 3 males, 1 female, same data, but II. 2020; 2 males, 1 female, Philippines, Mindanao / N Cotabato, Alamada / XII. 2018 / local collector leg.; 1 male, Philippines, Mindanao / N Cotabato, Alamada, Dado / III. 2019 / local collector leg.; 1 male, same data, but VII. 2019; 4 males, 3 females, same data, but I. 2020; 1 male, 1female, same data,

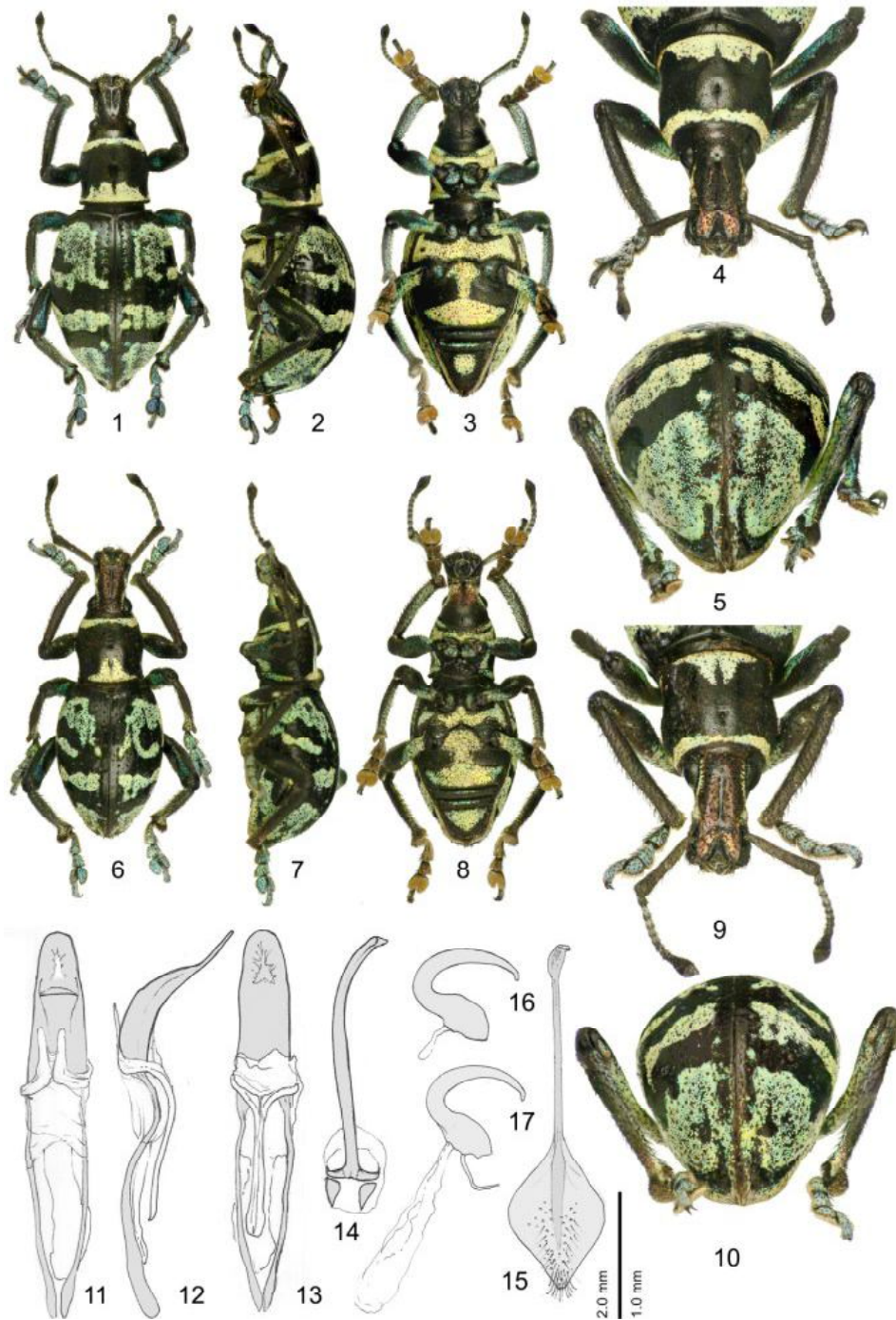


Fig. 9. *P. waoensis* sp. nov. (BRAA). 1-5 male; 6-10 female; 11-13 aedeagal body; 11 – sternite IX; 15 – sternite VIII; 16-17 spermatheca



but II. 2020 (all in BRAA). All with additional red label: "PARATYPE / *Polycatus waoensis* / Bramanti & Bramanti".

**Distribution.** Central Mindanao Island, Lanao del Sur, Wao (Fig. 10).

**Description.** Measurements (n=6): LB: 11.3-12.9 (holotype 12.6; mean 11.97); LR: 2.4-3.65 (holotype 2.4; mean 3.14); WR: 1.15-2.0 (holotype 1.15; mean 1.43); LP: 2.95-4.4 (holotype 3.75; mean 3.6); WP: 2.9-3.9 (holotype 3.75; mean 3.42); LE: 7.9-9.9 (holotype 9.5; mean 9.13); WE: 4.1-6.35 (holotype 6.35; mean 5.32).

Body black, with markings of pale blue to green round to recumbent scales on elytra, yellowish on pronotum and coppery on head and rostrum. Head minutely punctured. Eyes large, prominent from outline of head, with peak just in the middle. Forehead with large dorsal bulge from basal ½ to middle of rostrum, 2.5 times as wide as eye width. Rostrum twice as long as wide (LR/WR 2.10), dorsally with longitudinal groove from base of forehead to apical third of rostrum; rostrum with small, subtriangular mediodorsal; in dorsal contour with strong medial concavity, ventral part strongly widened at apical part; laterally with patch of bright golden scales, that circumscribes each eye; genae with long, dark hairs. Head and rostrum covered with general scales of coppery colour, underside with deep medial groove, scales only on medial part; antennal scrobe reaching anterior edge of eye. Antenna without general scales; basal antennomere 1.5 times as long as wide, as long as antennomere II, II twice as long as wide; III-VI subequal in size, same length and width; VII 1.5 times as long as wide; club strongly narrowed from base to just before the middle, widest along apical 1/2, apex gradually narrowed. Prothorax with weak medial impression on disc; same length and width (LP/WP 1.0), posterior edge slightly incurved medially; with the following markings: 1) transverse, continuous line along apical margin, line narrowed in middle and gradually extended to latero-ventral parts; 2) transverse line along basal margin; 3) spot on medial part of basal margin; 4) longitudinal line on latero-ventral part; 5) ventral part with dense general scales;

in dorsal contour widest just before the middle. Elytra distinctly rounded, LE/WE 1.5, rugose, with weakly expressed intervals of punctured rows, light brown hairs on apical half; each elytron with two more or less confluent scaly patches, each patch consists of various number of smaller, longitudinal or transverse patches, connected in various ways; in dorsal contour widest in middle; LE/LP 2.55, WE/WP 1.7; metasternum completely covered with general scales; ventrite I with patch of general scales on central part; II with large patch of general scales; III-IV with transverse line of metallic scales; V with small roundish patch centrally. Aedeagus as in Fig. 9.11-13.

Female. Measurements (n=3): LB: 14.55-15.35 (mean 14.9); LR: 2.75-3.7 (mean 3.23); WR: 1.6-2.0 (mean 1.78); LP: 4.1-5.2 (mean 4.77); WP: 3.7-4.0 (mean 3.88); LE: 11-11.9 (mean 11.32); WE: 6.85-7.75 (mean 7.17). (Fig. 9.6-10).

**Differential analysis.** The new species is similar to *P. eupholoides*, *P. mimicus* sp. nov., *P. bramanti* sp. nov. by its distinctly rounded elytra with moderately deep puncture rows (except *P. bramanti* sp. nov. with smooth elytra). The new species may be easily distinguished from *P. eupholoides* and *P. mimicus* sp. nov. by very large bulge on rostrum as well as unique scaly markings on elytra. Differences between *P. waoensis* sp. nov. and *P. bramanti* sp. nov. see above.

**Etymology.** The specific epithet is the latinized adjective derived from the area the specimens were collected from.

#### 8. *Polycatus bramantii* Rukmane, sp. nov. (Fig. 8, 10)

**Type material.** Holotype, Male (Fig. 8.1-5): PHILIPPINES / Mindanao, Lanao, Bayong / X. 2019 / local collector leg. (white label); HOLOTYPE / *Polycatus bramantii* / Rukmane (red label) (DUBC).

**Distribution.** Mindanao Island, Lanao del Sur, Bayang. Species is probably present at Piapayunang mountain (Fig. 10).

**Description.** Measurements (n=1): LB: 12.8; LR: 2.4; WR: 2.0; LP: 3.6; WP: 3.3; LE: 8.0; WE: 5.5.

Body black, with markings of metallic green, golden and coppery round to recumbent scales on elytra, coppery and yellow on pronotum and coppery to metallic green on legs, underside with weak lustre, with markings of bright yellow and green markings. Head with indistinct punctation. Eyes medium-sized, prominent from outline of head, peak just before the middle. Forehead with distinct dorsal bulge dorsally, four times

as wide as eye. Rostrum 1.5 times as long as head, longer than wide (LR/WR 1.2), evenly covered with scales except for medial groove, with medial longitudinal groove from base of the forehead to apical 2/3, with a few dark hairs dorsally; in dorsal contour straight at the ventral part, weakly bulging at apical part; in lateral contour moderately bulging from middle of forehead to middle of rostrum, then straight to apex; underside with longitudinal medial groove in all length. Antenna covered with elongated scales of metallic colour; antennal scape covered with irregularly dispersed dark hairs; antennomeres with dark hairs along midline of each antennomere; basal antennomere twice as long as wide, same length as antennomere II;



Fig. 10. Distribution map of studied *Polycatus* species

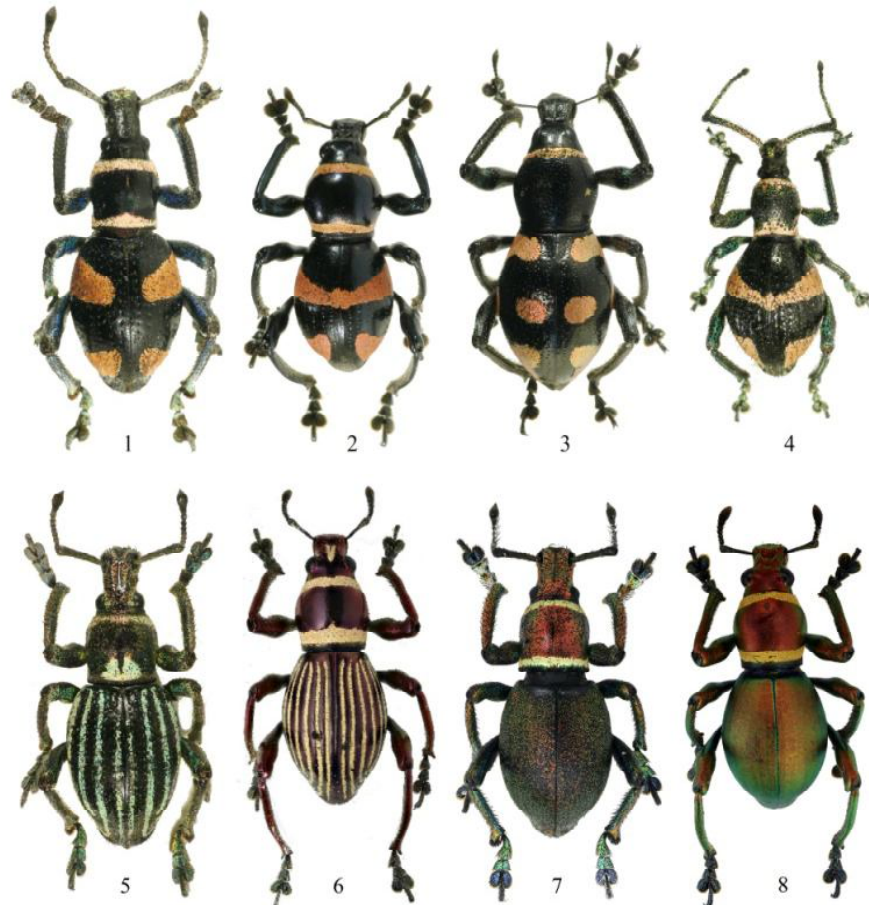


Fig. 11: 1 – *P. jaegeri* sp. nov.; 2 – *Pachyrhynchus zamboanganus* Yoshitake, 2012; 3 – *Metapocyrtus* sp.; 4 – *Calidiopsis speciosa* Heller, 1913; 5 – *P. mimicus* sp. nov.; 6 – *Pachyrhynchus tikoï* Rukmane, 2016; 7 – *P. bramanti* sp. nov.; 8 – *Pachyrhynchus subamabilis* Yoshitake, 2012

antennomere II 1.5 times as long as wide, twice as long as III; III-V subequal in size, same length and width, shorter and narrower than antennomeres VI-VII that are subequal in size; club widest in middle, apical part strongly narrowed, nearly 3 times as long as wide. Prothorax minutely punctured, nearly same length and width (LP/WP 1.09); with the following markings: 1) transverse continuous line of yellow scales along basal margin; 2) transverse continuous line of yellow scales along apical margin; 3) both lines connected on each latero-ventral part with additional, longitudinal line; 4) ventral part densely covered with yellow scales; 5) irregularly, densely dispersed scales of coppery colour on dorsum and lateral parts; weak

longitudinal medial groove on dorsum, from apical margin to basal 2/3; widest at apical 1/2, in dorsal contour narrowest along apical margin, widened to apical 1/2, moderately narrowed to slightly after middle and minutely widened to basal margin; in lateral contour with bulge at apical 2/3. Elytra covered with irregularly dispersed coppery to metallic scales; without expressed intervals, with short dark hairs on apical part in direction to apex; LE/WE 1.45; in dorsal contour widest just at the middle; LE/LP 2.22, WE/WP 1.66; metasternum covered with metallic scales; ventrite I with longitudinal line of scales on central part; II with ovate scally patch on central part; III and IV without scally spots; V with triangular shape scale spots

centrally. Legs covered with coppery to metallic scales in all length. Aedeagus as in Fig. 8.6-8.

Female unknown.

**Differential analysis.** This new species on the general appearance is similar to *P. waoensis* sp. nov., by its large bulge on the rostrum, but is easily distinguishable by the lack of scale spots on elytra and transverse line along basal margin of prothorax, that is continuous, without extension medially on disc. Additionally, elytra of *P. bramanti* sp. nov. lacking intervals on elytra unlike in *P. waoensis* sp. nov..

**Etymology.** Third author of this paper dedicate the new species to first two authors, brothers Alessandro and Andrea Bramanti, for their patience and big work involved into study of the current genus.

**Mimicry.** Pattern of this species corresponds to *Pachyrhynchus subamabilis* Yoshitake, 2012 found in the same location of Mindanao (Fig. 11.7-8).

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